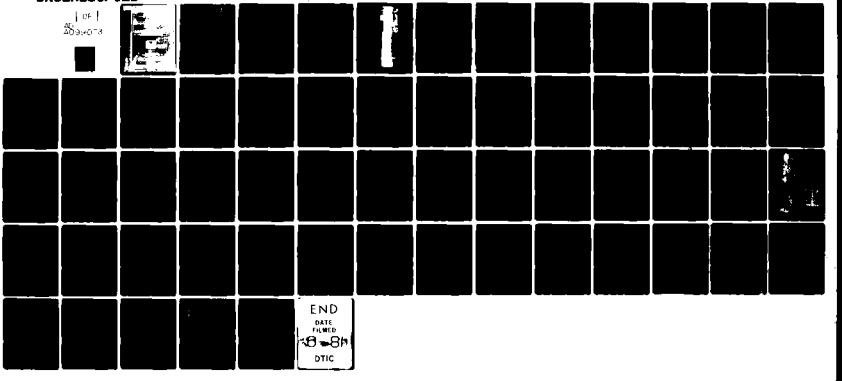
AD-A099 073 D'APPOLONIA CONSULTING ENGINEERS INC PITTSBURGH PA F/G 13/13
NATIONAL DAM INSPECTION PROGRAM. NEGRO POND DAM (NDI I.D. PA-08--ETC(U)
MAR 81 DACW31-81-C-0014

UNCLASSIFIED NL



END
DATE FILMED
6-81
DTIC

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Department of the Army, Office of Chief of Engineers, Washington, D.C. 20314.

The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon visual observations and review of available data. Detailed investigations and analyses involving topographic mapping, subsurface investigations, material testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the inspection is intended to identify any need for such studies which should be performed by the owner.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of the dam depends on numerous and constantly changing internal and external factors which are evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The assessment of the conditions and recommendations was made by the consulting engineer in accordance with generally and currently accepted engineering principles and practices.

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

NAME OF DAM: Negro Pond Dam
STATE LOCATED: Pennsylvania
COUNTY LOCATED: Wyoming
STREAM: Little Mehoopany Creek, tributary of the Susquehanna River
SIZE CLASSIFICATION: Small
HAZARD CLASSIFICATION: High
OWNER: Mr. Melvin Morris
DATE OF INSPECTION: November 15, 1980 and February 4, 1981

ASSESSMENT: Based on the evaluation of the existing conditions, the condition of Negro Pond Dam is considered to be poor. The dam essentially consists of a mound of stones. It appears that originally it was a dry stone wall backed by an earth fill. As it exists, flow from the reservoir partially flows over a low section on the dam and partially percolates through the rubble to the downstream toe.

The dam has no formal spillway facilities. Therefore, the flood discharge capacity of the dam is considered to be inadequate. A breach analysis indicated that failure of the dam during the passage of 50 percent PMF is likely to endanger the stability of a downstream dam and the combined discharge may cause loss of life and property damage. Consequently, the flood discharge capacity of the dam is considered to be seriously inadequate and the facility is classified to be unsafe/ nonemergency.

The following recommendations should be implemented as soon as possible or on a continuing basis:

1. The owner should immediately retain a professional engineer experienced in the design and construction of dams to initiate additional studies to more accurately determine the flood discharge capacity and the nature and extent of improvements required to provide adequate spillway capacity.

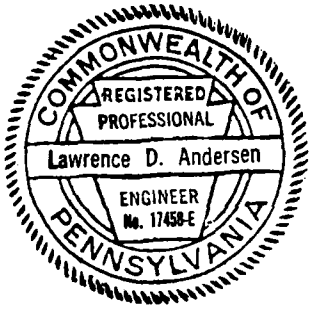
2. The owner should immediately initiate investigations to determine the modifications and improvements required to provide a structurally stable dam or to remove the structure.

3. In conjunction with these analyses, the need for installing a low level outlet facility should be investigated.

4. Around-the-clock surveillance should be provided during unusually heavy runoff and a

formal warning system developed to alert the downstream residents in the event of emergencies.

5. The owner should develop a formal operating and maintenance plan, inspect the dam regularly and perform necessary maintenance.



Lawrence D. Andersen, P.E.
Vice President

March 19, 1981
Date

Approved by:

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

24 APR 81
Date

NEGRO POND DAM
NDI I.D. PA-0889
DER I.D. 066-010
NOVEMBER 12, 1980

Looking Downstream

TABLE OF CONTENTS

	PAGE
SECTION 1 - PROJECT INFORMATION	1
1.1 General	1
1.2 Description of Project	1
1.3 Pertinent Data	2
SECTION 2 - DESIGN DATA	4
2.1 Design	4
2.2 Construction	4
2.3 Operation	4
2.4 Other Investigations	4
2.5 Evaluation	4
SECTION 3 - VISUAL INSPECTION	6
3.1 Findings	6
3.2 Evaluation	7
SECTION 4 - OPERATIONAL FEATURES	8
4.1 Procedure	8
4.2 Maintenance of the Dam	8
4.3 Maintenance of Operating Facilities	8
4.4 Warning System	8
4.5 Evaluation	8
SECTION 5 - HYDRAULICS AND HYDROLOGY	9
5.1 Evaluation of Features	9
SECTION 6 - STRUCTURAL STABILITY	11
6.1 Evaluation of Structural Stability	11
SECTION 7 - ASSESSMENT AND RECOMMENDATIONS/ PROPOSED REMEDIAL MEASURES	12
7.1 Dam Assessment	12
7.2 Recommendations/Remedial Measures	12

TABLE OF CONTENTS
(Continued)

APPENDIX A - CHECKLIST, VISUAL INSPECTION, PHASE I
APPENDIX B - CHECKLIST, ENGINEERING DATA, DESIGN, CONSTRUCTION, OPERATION, AND HYDROLOGIC AND HYDRAULIC, PHASE I
APPENDIX C - PHOTOGRAPHS
APPENDIX D - HYDROLOGY AND HYDRAULICS ANALYSES
APPENDIX E - PLATES
APPENDIX F - REGIONAL GEOLOGY

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM
NEGRO POND DAM
NDI I.D. PA-0889
DER I.D. 066-010

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority. The inspection was performed pursuant to the authority granted by The National Dam Inspection Act, Public Law 92-367, to the Secretary of the Army, through the Corps of Engineers, to conduct inspections of dams throughout the United States.

b. Purpose. The purpose of this inspection is to determine if the dam constitutes a hazard to human life or property.

1.2 Description of Project

a. Dam and Appurtenances. Negro Pond Dam consists essentially of a mound of large stones with an approximate length of 125 feet and a maximum height of 7 feet above the downstream toe. It appears that the dam was built across the outlet of a natural lake to raise the lake level. As a result, the geometry of the dam is undefined and the side slopes and dam crest cannot accurately be characterized. The dam has no definable spillway; flow over a low section on the crest maintains the normal pool elevation. The dam also has no outlet facilities.

b. Location. Negro Pond Dam is located (N41° 35.1', W76° 09.8') on Little Mehoopany Creek, approximately one mile west of the town of Jenningsville in Windham Township, Wyoming County, Pennsylvania. Plate 1 illustrates the location of the dam.

c. Size Classification. Small (based on 7-foot height and 753 acre-feet storage capacity at maximum pool).

d. Hazard Classification. The dam is classified to be in the high hazard category. Directly downstream of the dam is Chamberlain Pond (NDI I.D.: PA-0890). Chamberlain Pond discharges into Little Mehoopany Creek which flows through the town of Jenningsville and into Jennings Pond (NDI I.D.: PA-0891) at a distance of 0.8 mile downstream from the dam. Jennings Pond discharges again into Little Mehoopany Creek, which flows for another four miles downstream into the Susquehanna River. There are no homes located in the flood plain between Negro Pond Dam and Chamberlain Pond. Below Chamberlain Pond, approximately five houses, one church, and one general store are considered to be within the potential floodplain of Little Mehoopany Creek. It is estimated that failure of Negro Pond Dam would likely cause failure of downstream

Chamberlain Pond Dam and the combined discharge would cause loss of more than a few lives and appreciable property damage in this area.

e. Ownership. Mr. Melvin Morrison, R.D. #2, Box 316, Mehoopany, Pennsylvania 18629.

f. Purpose of Dam. Recreation.

g. Design and Construction History. No information is available on the design and construction of the dam. The dam was first inspected by the Commonwealth of Pennsylvania in 1919.

h. Normal Operating Procedure. The reservoir is normally maintained at the level of the low spot on the dam crest. The inflow occurring when the lake is at or above this elevation is discharged over the crest.

1.3 Pertinent Data. Elevations referred to in this and subsequent sections of the report were based on field measurements assuming the tailwater level to be at Elevation 1055 (USGS Datum), which is shown to be the normal pool level for Chamberlain Pond Dam in the USGS 7.5-minute Jenningsville quadrangle.

a. Drainage Area	4.8 square miles[1]
b. Discharge at Dam Site (cfs)	
Maximum known flood at dam site	Unknown
Outlet conduit at maximum pool	(No outlet pipe)
Gated spillway capacity at maximum pool	Not applicable[2]
Ungated spillway capacity at maximum pool	Not applicable[2]
Total spillway capacity at maximum pool	Not applicable[2]
c. Elevation (USGS Datum) (feet)	
Top of dam	1063.6 (measured low spot)
Maximum pool	1063.6
Normal pool	1063.6
Upstream invert outlet works	Not applicable[3]
Downstream invert outlet works	Not applicable
Maximum tailwater	Unknown
Toe of dam	1057±

[1] Planimetered from USGS topographic maps.

[2] The dam has no definable spillway facilities.

[3] The dam has no outlet pipe.

d. Reservoir Length (feet)

Normal pool level	4200
Maximum pool level	4300+

e. Storage (acre-feet)

Normal pool level	300
Maximum pool level	750

f. Reservoir Surface (acres)

Normal pool level	81
Maximum pool level	106

g. Dam

Type	Dry masonry
Length	125+ feet
Height	7 feet (approximate)
Top width	Undefined
Side slopes	Undefined

h. Regulating Outlet. The dam has no outlet facilities.

i. Spillway. The dam has no definable spillway. Flow over a low section on the crest of the dam maintains the normal pool elevation.

SECTION 2
DESIGN DATA

2.1 Design

a. Data Available. The available data consist of files provided by the Commonwealth of Pennsylvania, Department of Environmental Resources (PennDER), which contain correspondence and inspection reports.

(1) Hydrology and Hydraulics. No design information is available.

(2) Embankment. Available information consists of past inspection reports and correspondence.

(3) Appurtenant Structures. No design information is available.

b. Design Features

(1) Embankment. No information is available on the design of the dam. As shown in Plate 2, the dam is essentially a mound of large stones with an approximate length of 125 feet and a maximum height of 11 feet above the downstream toe. The geometry of the dam is undefined such that the side slopes and dam crest cannot be accurately characterized.

(2) Appurtenant Structures. As discussed in Section 1.2 a, the dam has no appurtenant structures.

c. Design Data

(1) Hydrology and Hydraulics. No design data are available.

(2) Embankment. No engineering data are available on the design of the embankment.

(3) Appurtenant Structures. No design information is available on the appurtenant structures.

2.2 Construction. No information is available on the construction of the dam.

2.3 Operation. There are no operating records maintained for the dam.

2.4 Other Investigations. None.

2.5 Evaluation

a. Availability. The available information was provided by PennDER.

b. Adequacy

(1) Hydrology and Hydraulics. No information is available.

(2) Embankment. No design and construction information is available to assess the adequacy of the design of the embankment.

(3) Appurtenant Structures. No design information is available for the appurtenant structures.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The onsite inspection of Negro Pond Dam consisted of:

1. Visual inspection of the embankment, abutments, and embankment toe.

2. Evaluation of downstream area hazard potential.

The specific observations are illustrated in Plate 2.

b. Embankment. The general inspection of the embankment consisted of searching for indications of structural distress and observing general maintenance conditions, erosion, and other surficial features.

In general, the condition of the dam is considered to be very poor. As mentioned in previous sections, the dam consists of a mound of large stones for which most of the structural integrity has been lost. Over the years, the original dry masonry wall has deteriorated to the present pile of stones. The upstream portion of the embankment appears to consist of earth fill due to silting near the upstream face. Discharge from the lake flows over a low section, partially percolating into the dam and discharging along the downstream toe.

The crest of the dam was surveyed and it was found to be very irregular in shape. The dam crest profile is illustrated in Plate 3.

c. Appurtenant Structures. The dam has no definable spillway or outlet works.

d. Reservoir Area. Sharpe's Pond Dam (NDI I.D.: PA-0888), which impounds a reservoir with a surface area of 45 acres at normal pool level, is located approximately 1.5 miles upstream of Negro Pond Dam.

A map review indicates that the Negro Pond watershed is predominantly covered by woodlands. A review of the regional geology is included in Appendix F.

e. Downstream Channel. Directly downstream of the dam is Chamberlain Pond which has a height of 18 feet and impounds a reservoir with a surface area of 49 acres at normal pool. Chamberlain Pond Dam is a dry masonry wall with an upstream earth fill. The 62-foot-wide spillway can pass 1360 cfs at maximum pool. The spillway discharges into Little Mehoopany Creek, which flows through the town of Jenningsville and into Jennings Pond at a distance of 0.8 mile below the dam. Jennings Pond

is an 11-foot dry masonry wall with rock fill on the upstream side and impounds a reservoir with a 37-acre surface area at normal pool. The spillway is 61 feet wide and can pass 700 cfs at maximum pool.

3.2 Evaluation. The dam essentially is a mound of stones requiring complete reconstruction or removal.

SECTION 4
OPERATIONAL FEATURES

4.1 Procedure. There are no formal operating procedures for the dam. The reservoir is normally maintained at the level of the low spot on the embankment crest with excess inflow discharging over the crest and through the downstream portion of the dam.

4.2 Maintenance of the Dam. The maintenance of the dam is considered to be very poor. As discussed in Section 3, it appears that no attempt has been made to upgrade its condition. A large amount of debris, such as uprooted tree stumps, lies upstream and downstream of the dam, and large stones are situated in a random order within the embankment.

4.3 Maintenance of Operating Facilities. The dam has no operating facilities.

4.4 Warning System. No formal warning system exists for the dam. Telephone communication facilities are available via residences approximately one-half mile downstream from the dam.

4.5 Evaluation. The dam is a mound of stones requiring complete reconstruction or removal.

SECTION 5
HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. Negro Pond Dam has a watershed area of 4.8 square miles and impounds a reservoir with a surface area of 80.8 acres at normal pool level. The dam has no flood discharge facilities. Flow over a low section of the dam maintains the lake at its current level. The dam was constructed at the outlet of a natural lake to raise the lake level.

b. Experience Data. As previously stated, Negro Pond Dam is classified as a small dam in the high hazard category. Under the recommended criteria for evaluating emergency spillway discharge capacity, such impoundments are required to pass one-half to full PMF. Due to the small height of the dam (11 feet), one-half PMF was selected as the spillway design flood.

The PMF inflow hydrograph for the reservoir was determined utilizing the Dam Safety Version of the HEC-1 computer program developed by the Hydrologic Engineering Center of the U.S. Army, Corps of Engineers. Data used for the computer analysis are presented in Appendix D. The inflow hydrographs were found to have peak flows of 11,130 and 5562 cfs for full and one-half PMF, respectively. The computer input and a summary of computer output are also included in Appendix D.

c. Visual Observations. On the date of inspection, no conditions were observed that would indicate that the capacity of the flow over the dam would be significantly reduced in the event of a flood.

d. Overtopping Potential. Various percentages of the PMF inflow hydrograph were routed through Sharpe's Pond reservoir then through a highway embankment culvert, combined with the corresponding PMF hydrograph from Negro Pond watershed, and routed through Negro Pond. Because Negro Pond Dam has no spillway, no inflow could be passed without overtopping the dam. For 50 percent of the PMF, the analyses indicated that the low spot on the dam crest would be overtopped for a duration of 31.0 hours to a maximum depth of 6.3 feet. It is estimated that overtopping of the low section by approximately five feet would initiate breaching of the dam.

e. Spillway Adequacy. Since the dam cannot pass the recommended design flood of one-half the PMF without endangering the stability of the dam, the flood discharge capacity is classified to be inadequate. A breach analysis was conducted to analyze whether failure resulting from overtopping would significantly increase the loss of life or damage downstream from the dam over that which would exist just before overtopping failure. The hydrograph resulting from failure of Negro Pond Dam was routed through Chamberlain Pond to determine if the Chamberlain Pond Dam would be overtopped by a depth great enough to cause failure.

For breach analyses, a trapezoidal breach was assumed with a 125-foot bottom width, 0.5 horizontal to 1 vertical side slopes, and a depth of 11.5 feet. The duration of failure was taken as 0.6 hour, and it was assumed that the breaching would initiate when the dam is overtopped by five feet, which corresponds to the approximate top of the dam near the left and right abutments. The computer outputs for the breach analysis are included in Appendix D.

Review of the flood stages in Chamberlain Pond resulting from failure of Negro Pond Dam indicates that the depth of overtopping over the nonoverflow sections of Chamberlain Pond Dam would increase from about one foot before failure to about five feet after failure of Negro Pond Dam. This increase is considered to pose a significant increase in downstream damage potential. Therefore, the flood discharge capacity of the Negro Pond Dam is considered to be seriously inadequate.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

(1) Embankment. As discussed in Section 3, the dam consists of a mound of large stones. Due to the random orientation, it is not possible to formally evaluate the structural stability of the dam. However, due to large amounts of stones forming the dam, the existing configuration is considered stable under normal pool conditions. Discharge from the lake flows over a low section partially percolating into the dam and discharging along the downstream toe.

(2) Appurtenant Structures. The dam has no appurtenant structures.

b. Design and Construction Data

(1) Embankment. As discussed above, due to the condition of the dam the stability of the dam cannot be analyzed.

(2) Appurtenant Structures. The dam has no appurtenant structures.

c. Operating Records. None available.

d. Postconstruction Changes. None reported.

e. Seismic Stability. The dam is located in Seismic Zone 1. Based on visual observations, the static stability of the dam cannot be determined, consequently seismic stability of the dam is also uncertain.

SECTION 7
ASSESSMENT AND RECOMMENDATIONS/PROPOSED REMEDIAL MEASURES

7.1 Dam Assessment

a. Assessment. The visual observations indicate that the Negro Pond Dam is in very poor condition. It appears that the dam originally consisted of a dry stone wall backed by an earth fill. Presently, it is essentially a mound of stones. Flow from the lake partially flows over a low section on the dam and partially percolates into the rubble discharging at the downstream toe. Due to the random nature of the structure, the stability of the dam cannot formally be determined. However, it appears to be sufficiently stable under normal conditions. It is recommended that a professional engineer evaluate the present condition of the dam and determine the remedial measures required to restore or remove the dam.

Because the dam has no spillway, no flow can pass without overtopping the dam. A breach analysis and downstream routing indicated that failure of Negro Pond Dam is likely to cause failure of Chamberlain Pond Dam which in turn will cause loss of life and property damage. Therefore, the flood discharge capacity of Negro Pond Dam is classified as seriously inadequate and the facility is considered to be unsafe/nonemergency.

b. Adequacy of Information. The available information, in conjunction with the visual observations, is considered to be sufficient to make a Phase I evaluation.

c. Urgency. The following recommendations should be implemented as soon as possible or on a continuing basis.

d. Necessity for Additional Investigation. In view of the seriously inadequate spillway capacity, the owner should immediately initiate additional studies to more accurately ascertain the extent of improvements required to provide adequate spillway capacity.

7.2 Recommendations/Remedial Measures. It is recommended that:

1. The owner should immediately retain a professional engineer experienced in the design and construction of dams to initiate additional studies to more accurately determine the flood discharge capacity and the nature and extent of improvements required to provide adequate spillway capacity.

2. The owner should immediately initiate investigations to determine the modifications and improvements required to provide a structurally stable dam or to remove the structure.

3. In conjunction with these analyses, the need for installing a low level outlet facility should be investigated.

4. Around-the-clock surveillance should be provided during unusually heavy runoff and a formal warning system developed to alert the downstream residents in the event of emergencies.

5. The owner should develop a formal operating and maintenance plan, inspect the dam regularly and perform necessary maintenance.

APPENDIX A

CHECKLIST
VISUAL INSPECTION
PHASE I

APPENDIX A

CHECKLIST
VISUAL INSPECTION
PHASE I

NDI: PA-0889
NAME OF DAM Negro Pond COUNTY Wyoming STATE Pennsylvania ID# DER: 066-010

TYPE OF DAM Dry masonry HAZARD CATEGORY Significant

DATE(S) INSPECTION November 15, 1980 WEATHER Cloudy TEMPERATURE 40's

POOL ELEVATION AT TIME OF INSPECTION 1063.4 M.S.L. TAILWATER AT TIME OF INSPECTION 1057 M.S.L.

INSPECTION PERSONNEL:	REVIEW INSPECTION PERSONNEL: (February 4, 1981)
Douglas Cosler	Lawrence D. Andersen
Arthur Smith	James H. Poellot
Bilgin Erel	Bilgin Erel

OWNER' REPRESENTATIVE:

Mr. Melvin Morrison (Owner)

Bilgin Erel RECORDER

VISUAL INSPECTION
PHASE I
CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	One seepage point below the toe of the dam. Approximate discharge = 2 to 4 gpm.	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Dam is essentially a mound of rubble with no definable structure.	
DRAINS	None found.	
WATER PASSAGES	Water flows through the dam rather than over it.	
FOUNDATION	See comments for structure to abutment junctions.	

VISUAL INSPECTION
PHASE I
CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	Dry masonry dam, N/A.	
STRUCTURAL CRACKING	Dry masonry dam, N/A.	
VERTICAL AND HORIZONTAL ALIGNMENT	Dam is essentially a mound of rubble and has no definable geometry. See Plate 3 for approximate crest profile.	
MONOLITH JOINTS	Masonry dam, N/A.	
CONSTRUCTION JOINTS	No construction joints.	
STAFF GAGE OF RECORDER:	None found.	

VISUAL INSPECTION
PHASE I
OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	The dam has no outlet works.	
INTAKE STRUCTURE	N/A	
OUTLET STRUCTURE	N/A	
OUTLET CHANNEL	N/A	
EMERGENCY GATE	N/A	

VISUAL INSPECTION
PHASE I
UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	The dam has no definable spillway. Flow over a low section of the dam maintains the lake at its current level.	
APPROACH CHANNEL	Lake	
DISCHARGE CHANNEL	Natural stream channel.	
BRIDGE AND PIERS	None	

VISUAL INSPECTION
PHASE I
GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	The dam has no gated spillway.	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

VISUAL INSPECTION
PHASE I
INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER	None	

VISUAL INSPECTION
PHASE I
RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	No problems observed.	
SEDIMENTATION	Unknown	
UPSTREAM RESERVOIRS	Sharpe's Pond, DER I.D.: 066-009.	

VISUAL INSPECTION
PHASE I
DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	No problems observed. Backwater from the downstream Chamberlain Pond (DER I.D.: 066-011) may result from raised pool elevations.	
SLOPES	No problems observed.	
APPROXIMATE NUMBER OF HOMES AND POPULATION	None. Chamberlain Pond is located immediately downstream from this dam. Below Chamberlain Pond, approximately five houses, one church, and one general store are considered to be within the potential flood plain of Little Mehoopany Creek.	

APPENDIX B

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
AND HYDROLOGIC AND HYDRAULIC
PHASE I

APPENDIX B

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Negro Pond

ID# NDI: PA-0889
DER: 066-010

ITEM	REMARKS
AS-BUILT DRAWINGS	No drawings available.
REGIONAL VICINITY MAP	See Plate 1.
CONSTRUCTION HISTORY	Not available.
TYPICAL SECTIONS OF DAM	See Plate 2 (sections defined according to field measurements).
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	No existing outlet facilities.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
RAINFALL/RESERVOIR RECORDS	None available.
DESIGN REPORTS	None available.
GEOLOGY REPORTS	None available.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	No design computations reported.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	No investigations reported.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
POST CONSTRUCTION SURVEYS OF DAM	None available.
BORROW SOURCES	None
MONITORING SYSTEMS	None
MODIFICATIONS	None reported.
HIGH POOL RECORDS	No records available.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None available.
MAINTENANCE OPERATION RECORDS	No records available.
SPILLWAY PLAN SECTIONS DETAILS	None available.
OPERATING EQUIPMENT PLANS AND DETAILS	No operating equipment.

CHECKLIST
ENGINEERING DATA
HYDROLOGIC AND HYDRAULIC

DRAINAGE AREA CHARACTERISTICS: 4.8 square miles (wooded)

ELEVATION, TOP OF NORMAL POOL AND STORAGE CAPACITY: 1063.6 (297 acre-feet)

ELEVATION, TOP OF FLOOD CONTROL POOL AND STORAGE CAPACITY: 1068.5 (753 acre-feet)

ELEVATION, MAXIMUM DESIGN POOL: 1068.5 (design pool unknown)

ELEVATION, TOP OF DAM: 1068.5 (approximate top of dam)

SPILLWAY:

a. Elevation No definable spillway

b. Type N/A

c. Width N/A

d. Length N/A

e. Location Spillover N/A

f. Number and Type of Gates None

OUTLET WORKS:

a. Type No existing outlet facilities

b. Location N/A

c. Entrance Inverts N/A

d. Exit Inverts N/A

e. Emergency Drawdown Facilities None

HYDROMETEOROLOGICAL GAGES:

a. Type No gages

b. Location N/A

c. Records None

MAXIMUM NONDAMAGING DISCHARGE: Not determined, due to undefinable spillway

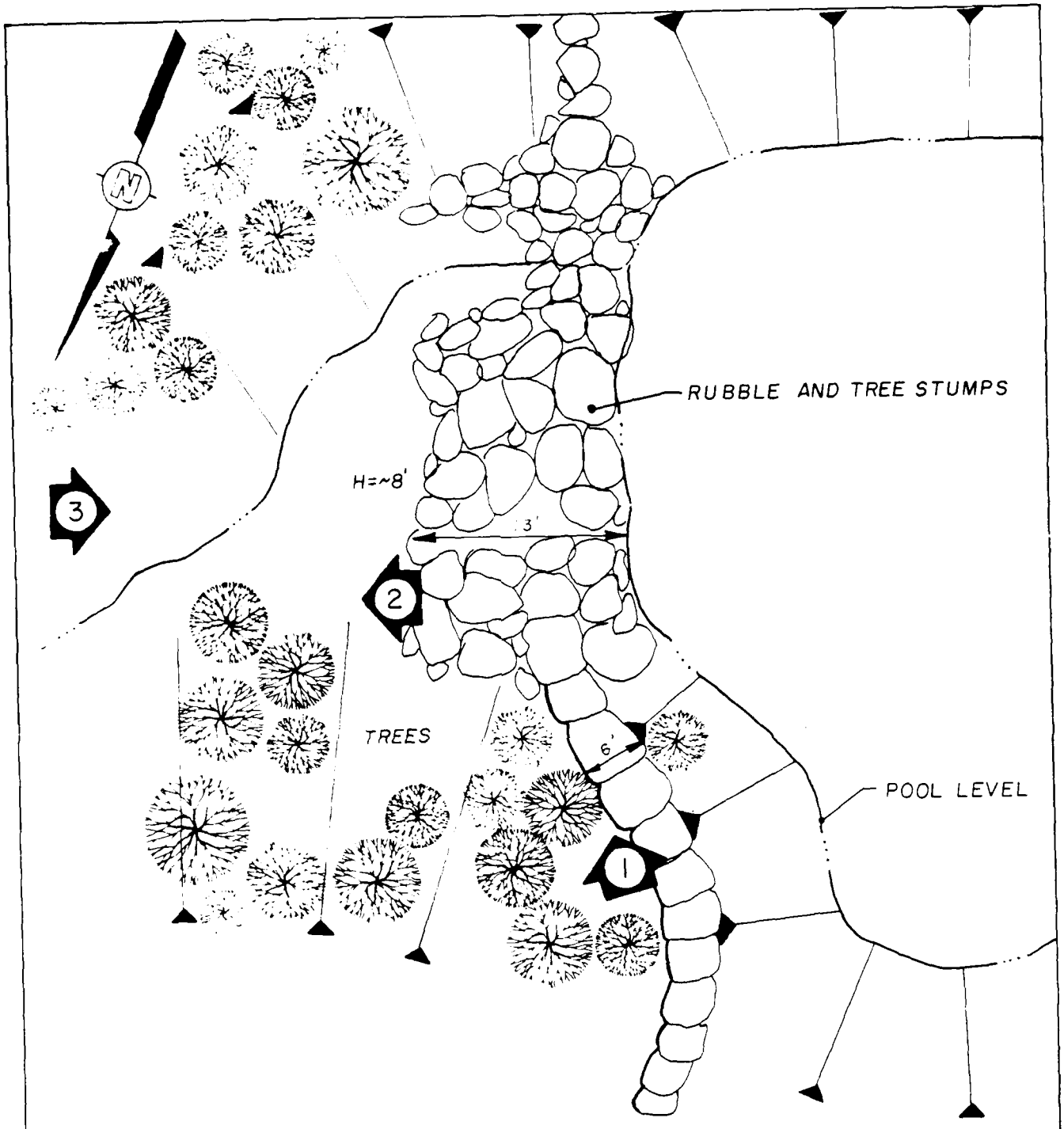
APPENDIX C

PHOTOGRAPHS

LIST OF PHOTOGRAPHS
NEGRO POND DAM
NDI I.D. NO. PA-0889
NOVEMBER 12, 1980

PHOTOGRAPH NO.	DESCRIPTION
1	Crest (looking south).
2	Discharge channel (looking downstream).
3	Downstream face of dam.

80-556



LEGEND:

2 INDICATES DIRECTION IN WHICH PHOTOGRAPH WAS TAKEN

NEGRO POND DAM
KEY PLAN OF PHOTOGRAPHS
FIELD INSPECTION DATE: NOV. 15, 1980

DAPPOLONIA

NOT TO SCALE

PHOTOGRAPH NO. 1

PHOTOGRAPH NO. 2

PHOTOGRAPH NO. 3

APPENDIX D

HYDROLOGY AND HYDRAULICS ANALYSES

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Negro Pond Dam

PROBABLE MAXIMUM PRECIPITATION (PMP) = 22.2 INCHES/24 HOURS

STATION	1	2	3	4	5
Station Description	Sharpe's Pond Reservoir	Sharpe's Pond Dam	4-Foot-Diameter Road Culvert	Negro Pond Reservoir	Negro Pond Dam
Drainage Area (square miles)	0.99	-	-	3.78	-
Cumulative Drainage Area (square miles)	0.99	0.99	0.99	4.77	4.77
Adjustment of PMF for Drainage Area (%)(1)	97%			97%	
6 Hours	117	-	-	117	-
12 Hours	127	-	-	127	-
24 Hours	136	-	-	136	-
48 Hours	145	-	-	145	-
72 Hours	-	-	-	-	-
Snyder Hydrograph Parameters					
Zone(2)	11	-	-	11	-
C_p/C_t(3)	0.62/1.5	-	-	0.62/1.5	-
L (miles)(4)	1.23	-	-	3.31	-
L_{ca} (miles)(4)	0.44	-	-	0.95	-
$t_p = C_t(L \cdot L_{ca})^{0.3}$ (hours)	1.24	-	-	2.11	-
Spillway Data					
Crest Length (ft)	-	9.4 (perimeter length)	See road culvert capacity calculations	-	Dam has no spillway
Freeboard (ft)	-	1.1		-	
Discharge Coefficient	-	Varies		-	
Exponent	-	1.5		-	

(1) Hydrometeorological Report 40, U.S. Weather Bureau, 1965.
(2) Hydrological zone defined by Corps of Engineers, Baltimore District, for determining Snyder's Coefficients (C_p and C_t).
(3) Snyder's Coefficients.
(4) L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

STORAGE VS. ELEVATION

ELEVATION	ΔH, FEET	AREA (acres)(1)	ΔVOLUME (acre-feet)(2)	STORAGE (acre-feet)
1080.0		164.4		2267.2
	16.4		1970.5	
1063.6 (Normal pool elevation)		80.8		296.7
	6.6		296.7	
1057.0(3)		17.0		0

(1) Planimetered from USGS maps.
(2) $\Delta Volume = \Delta H/3 \ (A_1 + A_2 + \sqrt{A_1 A_2})$.
(3) Estimated reservoir bottom elevation.

NAME OF DAM: Negro Pond Dam (Continued)

PROBABLE MAXIMUM PRECIPITATION (PMP) = 22.2 INCHES/24 HOURS

STATION	6	7	8	9	10
Station Description	Chamberlain Pond Dam				
Drainage Area (square miles)	-				
Cumulative Drainage Area (square miles)	4.77				
Adjustment of PMF for Drainage Area (%)[1]					
6 Hours	-				
12 Hours	-				
24 Hours	-				
48 Hours	-				
72 Hours	-				
Snyder Hydrograph Parameters					
Zone[2]	-				
C_p/C_t[3]	-				
L (miles)[4]	-				
L_{ca} (miles)[4]	-				
$t_p = C_t(L \cdot L_{ca})^{0.3}$ (hours)	-				
Spillway Data					
Crest Length (ft)	62.0				
Freeboard (ft)	3.7				
Discharge Coefficient	3.08				
Exponent	1.5				

[1] Hydrometeorological Report 40, U.S. Weather Bureau, 1965.
[2] Hydrological zone defined by Corps of Engineers, Baltimore District, for determining Snyder's Coefficients (C_p and C_t).
[3] Snyder's Coefficients.
[4] L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

STORAGE VS. ELEVATION

ELEVATION	ΔH, FEET	AREA (acres)[1]	ΔVOLUME (acre-feet)[2]	STORAGE (acre-feet)

[1] Planimetered from USGS maps.
[2] $\Delta Volume = \Delta H/3 \ (A_1 + A_2 + \sqrt{A_1 A_2})$.

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION  01 APR 80
**********
    1                A1       SNYDER HYDROGRAPH,OVERTOPPING,DAMBREACH,AND D/S CHANNEL ROUTING ANALYSIS
    2                A2       NEGRO POND DAM (DER I.D. 66-10) WYOMING COUNTY,PA.  PROJECT NO.80-555-06
    3                A3       FOR 20%,30%,40%,50%,60%,70%,80%,90%,AND 100% PROBABLE MAXIMUM FLOOD(PMF)
    4                B     266        0       12        0        0        0        0        0       -4        0
    5                B1      5
    6                J       2        9        1
    7                J1   0.20     0.30     0.40     0.50     0.60     0.70     0.80     0.90     1.00
    8                K       0        1                                                  1
    9                K1       CALCULATION OF SNYDER INFLOW HYDROGRAPH TO SHARPE'S POND,(DER 66-09)
   10                M       1        1     0.99                4.77                                    1
   11                P                21.5      117      127      136      145
   12                T                                                             1.0      0.5             0.0709
   13                W    1.24     0.62
   14                X    -1.5    -0.05      2.0
   15                K       1        2                                                  1
   16                K1       ROUTING FLOW THROUGH SHARPE'S POND,(DER 66-09)
   17                Y                                         1        1
   18                Y1      1                                                  -1135.0       -1
   19                Y41135.0  1135.2   1135.4   1135.6   1135.8   1136.0 1136.13   1137.0   1138.0   1138.5
   20                Y41139.0 1139.54   1140.0   1141.0   1142.0   1143.0
   21                Y5   0.00      2.7      7.6     14.0     21.6     30.2     36.2     48.1     59.0     63.7
   22                Y5   68.1     72.5     73.3     75.0     76.7     78.3
   23                $A   45.0     56.0     99.2
   24                $E1135.0  1140.0   1160.0
   25                $$1135.0
   26                $D1136.1     2.65      1.5    525.0
   27                $L 100.0    150.0    200.0    250.0    300.0    350.0    450.0    475.0    513.0    525.0
   28                $V1136.1  1136.2   1136.5   1136.9   1137.0   1137.1   1137.2   1137.4   1139.2   1141.3
   29                K       1        3                                                  1
   30                K1       ROUTING FLOW THROUGH 4 FEET DIAM. CULVERT.  HOMES AT ELEVATION 1105
   31                Y                                         1        1
   32                Y1      1                                                  -1100.0       -1
   33                Y41100.0  1101.0   1102.0   1103.0   1104.0   1105.0   1106.0   1107.0   1108.0   1109.0
   34                Y41110.0  1112.0   1114.0   1116.0   1118.0   1120.0   1122.0   1124.0
   35                Y5    0.0     10.0     23.0     46.0     72.0     95.0    117.0    132.0    146.0    158.0
   36                Y5 170.0    191.0    210.0    227.0    243.0    259.0    273.0    286.0
   37                $A    0.9      4.6     18.4
   38                $E1100.0  1120.0   1140.0
   39                $$1100.0
   40                $D1120.0     2.65      1.5    400.0
   41                K       0        4                                                  1
   42                K1       CALCULATION OF SNYDER INFLOW HYDROGRAPH TO NEGRO POND,(DER 66-10)
   43                M       1        1     3.78                4.77                                    1
   44                P                21.5      117      127      136      145
   45                T                                                             1.0      0.5             0.0335
   46                W    2.11     0.62
   47                X    -1.5    -0.05      2.0
   48                K       2        4                                                  1
   49                K1       COMBINED INFLOW HYDROGGRAPH TO NEGRO POND,(DER 66-10)
   50                K       1        5                                                  1
```

```
51              K1      ROUTING FLOW THROUGH NEGRO POND (DER 66-10)
52              Y                                       1       1
53              Y1     1                                                -1063.6
54              $A  17.0     80.8    164.4    247.0
55              $E1057.0  1063.6  1080.0  1100.0
56              $$1063.6    0.001    0.01     1.5
57              $D1063.7     2.65     1.5   325.0
58              $L  25.0     40.0     55.0     70.0     85.0     95.0    110.0    125.0    325.0
59              $V1063.7  1064.9  1065.3  1065.5  1066.2  1067.1  1067.8  1068.2  1068.5
60              $B 125.0      0.5  1057.0     0.60  1063.6  1100.0
61              $B 125.0      0.5  1057.0     0.60  1063.6  1068.7
62              K       1       7                                               1
63              K1      ROUTING FLOW THROUGH CHAMBERLAIN POND (DER 66-11)
64              Y                                       1       1
65              Y1     1                                                -1055.0
66              $A   8.0     48.7     67.0    104.7
67              $E1041.0  1055.0  1060.0  1080.0
68              $$1055.0     62.0     3.08     1.5
69              $D1058.7     3.08     1.5     83.0
70              $L  22.0     40.0     83.0
71              $V1058.7  1059.1  1064.4
72              K      99
```

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS								
				RATIO 1 .20	RATIO 2 .30	RATIO 3 .40	RATIO 4 .50	RATIO 5 .60	RATIO 6 .70	RATIO 7 .80	RATIO 8 .90	RATIO 9 1.00
HYDROGRAPH AT	1	.99	1	603.	904.	1206.	1507.	1808.	2110.	2411.	2713.	3014.
	(	2.56)	(	17.07)(	25.60)(	34.14)(	42.67)(	51.21)(	59.74)(	68.28)(	76.81)(	85.35)
			2	603.	904.	1206.	1507.	1808.	2110.	2411.	2713.	3014.
			(	17.07)(	25.60)(	34.14)(	42.67)(	51.21)(	59.74)(	68.28)(	76.81)(	85.35)
ROUTED TO	2	.99	1	432.	764.	1098.	1411.	1720.	2022.	2322.	2620.	2918.
	(	2.56)	(	12.22)(	21.63)(	31.09)(	39.95)(	48.70)(	57.26)(	65.75)(	74.20)(	82.64)
			2	432.	764.	1098.	1411.	1720.	2022.	2322.	2620.	2918.
			(	12.22)(	21.63)(	31.09)(	39.95)(	48.70)(	57.26)(	65.75)(	74.20)(	82.64)
ROUTED TO	3	.99	1	247.	816.	1264.	1606.	1752.	2008.	2323.	2617.	2920.
	(	2.56)	(	7.00)(	23.10)(	35.78)(	45.49)(	49.62)(	56.87)(	65.79)(	74.10)(	82.69)
			2	247.	816.	1264.	1606.	1752.	2008.	2323.	2617.	2920.
			(	7.00)(	23.10)(	35.78)(	45.49)(	49.62)(	56.87)(	65.79)(	74.10)(	82.69)
HYDROGRAPH AT	4	3.78	1	1703.	2555.	3407.	4259.	5110.	5962.	6814.	7665.	8517.
	(	9.79)	(	48.24)(	72.35)(	96.47)(	120.59)(	144.71)(	168.82)(	192.94)(	217.06)(	241.18)
			2	1703.	2555.	3407.	4259.	5110.	5962.	6814.	7665.	8517.
			(	48.24)(	72.35)(	96.47)(	120.59)(	144.71)(	168.82)(	192.94)(	217.06)(	241.18)
2 COMBINED	4	4.77	1	1890.	3351.	4528.	5562.	6693.	7795.	8910.	10019.	11130.
	(	12.35)	(	53.52)(	94.88)(	128.23)(	157.50)(	189.53)(	220.74)(	252.32)(	283.72)(	315.17)
			2	1890.	3351.	4528.	5562.	6693.	7795.	8910.	10019.	11130.
			(	53.52)(	94.88)(	128.23)(	157.50)(	189.53)(	220.74)(	252.32)(	283.72)(	315.17)
ROUTED TO	5	4.77	1	1293.	2408.	3682.	4894.	6079.	7223.	8360.	9473.	10572.
	(	12.35)	(	36.62)(	68.18)(	104.25)(	138.58)(	172.14)(	204.54)(	236.73)(	268.25)(	299.37)
			2	1293.	2408.	13784.	14810.	15299.	15905.	16254.	16344.	16216.
			(	36.62)(	68.18)(	390.32)(	419.36)(	433.23)(	450.37)(	460.27)(	462.81)(	459.19)
ROUTED TO	7	4.77	1	1077.	1978.	3092.	4231.	5364.	6498.	7629.	8733.	9855.
	(	12.35)	(	30.50)(	56.00)(	87.55)(	119.81)(	151.90)(	184.00)(	216.04)(	247.28)(	279.06)
			2	1077.	1978.	7440.	8397.	9073.	9896.	10518.	11045.	11490.
			(	30.50)(	56.00)(	210.68)(	237.77)(	256.91)(	280.22)(	297.84)(	312.77)(	325.36)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1135.00	1135.00	1136.10
STORAGE	0.	0.	51.
OUTFLOW	0.	0.	35.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1136.88	.78	89.	432.	9.40	41.80	0.00
.30	1137.19	1.09	104.	764.	10.80	41.40	0.00
.40	1137.40	1.30	114.	1098.	12.00	41.20	0.00
.50	1137.56	1.46	122.	1411.	12.80	41.00	0.00
.60	1137.71	1.61	130.	1720.	13.40	41.00	0.00
.70	1137.84	1.74	136.	2022.	14.00	41.00	0.00
.80	1137.96	1.86	143.	2322.	14.60	41.00	0.00
.90	1138.08	1.98	149.	2620.	15.00	41.00	0.00
1.00	1138.19	2.09	154.	2918.	15.40	41.00	0.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1135.00	1135.00	1136.10
STORAGE	0.	0.	51.
OUTFLOW	0.	0.	35.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1136.88	.78	89.	432.	9.40	41.80	0.00
.30	1137.19	1.09	104.	764.	10.80	41.40	0.00
.40	1137.40	1.30	114.	1098.	12.00	41.20	0.00
.50	1137.56	1.46	122.	1411.	12.80	41.00	0.00
.60	1137.71	1.61	130.	1720.	13.40	41.00	0.00
.70	1137.84	1.74	136.	2022.	14.00	41.00	0.00
.80	1137.96	1.86	143.	2322.	14.60	41.00	0.00
.90	1138.08	1.98	149.	2620.	15.00	41.00	0.00
1.00	1138.19	2.09	154.	2918.	15.40	41.00	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1100.00	1100.00	1120.00
STORAGE	0.	0.	50.
OUTFLOW	0.	0.	259.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1118.51	0.00	44.	247.	0.00	43.80	0.00
.30	1120.65	.65	53.	816.	3.00	41.80	0.00
.40	1120.96	.96	55.	1264.	3.80	41.20	0.00
.50	1121.17	1.17	56.	1606.	4.60	40.80	0.00
.60	1121.25	1.25	56.	1752.	5.00	41.00	0.00
.70	1121.39	1.39	57.	2008.	5.40	41.00	0.00
.80	1121.55	1.55	58.	2323.	5.80	41.00	0.00
.90	1121.70	1.70	59.	2617.	6.00	41.00	0.00
1.00	1121.84	1.84	60.	2920.	6.40	41.00	0.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1100.00	1100.00	1120.00
STORAGE	0.	0.	50.
OUTFLOW	0.	0.	259.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1118.51	0.00	44.	247.	0.00	43.80	0.00
.30	1120.65	.65	53.	816.	3.00	41.80	0.00
.40	1120.96	.96	55.	1264.	3.80	41.20	0.00
.50	1121.17	1.17	56.	1606.	4.60	40.80	0.00
.60	1121.25	1.25	56.	1752.	5.00	41.00	0.00
.70	1121.39	1.39	57.	2008.	5.40	41.00	0.00
.80	1121.55	1.55	58.	2323.	5.80	41.00	0.00
.90	1121.70	1.70	59.	2617.	6.00	41.00	0.00
1.00	1121.84	1.84	60.	2920.	6.40	41.00	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1063.60	1063.60	1063.70
STORAGE	297.	297.	305.
OUTFLOW	0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1067.53	3.83	647.	1293.	16.20	43.60	0.00
.30	1068.69	4.99	765.	2408.	18.40	43.00	0.00
.40	1069.40	5.70	839.	3682.	23.60	42.60	0.00
.50	1069.95	6.25	899.	4894.	31.00	42.40	0.00
.60	1070.42	6.72	952.	6079.	33.60	42.20	0.00
.70	1070.85	7.15	1000.	7223.	34.40	42.00	0.00
.80	1071.25	7.55	1046.	8360.	35.00	42.00	0.00
.90	1071.62	7.92	1089.	9473.	35.40	42.00	0.00
1.00	1071.97	8.27	1130.	10572.	35.60	42.00	0.00

PLAN 2 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1063.60	1063.60	1063.70
STORAGE	297.	297.	305.
OUTFLOW	0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1067.53	3.83	647.	1293.	16.20	43.60	0.00
.30	1068.69	4.99	765.	2408.	18.40	43.00	0.00
.40	1068.99	5.29	796.	13784.	13.20	42.20	41.60
.50	1069.30	5.60	829.	14810.	27.40	41.80	41.20
.60	1069.32	5.62	831.	15299.	23.00	41.60	41.40
.70	1069.50	5.80	850.	15905.	24.20	41.20	40.60
.80	1069.56	5.86	857.	16254.	25.20	41.00	40.40
.90	1069.53	5.83	853.	16344.	25.80	40.80	40.20
1.00	1069.42	5.72	841.	16216.	26.40	40.60	40.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

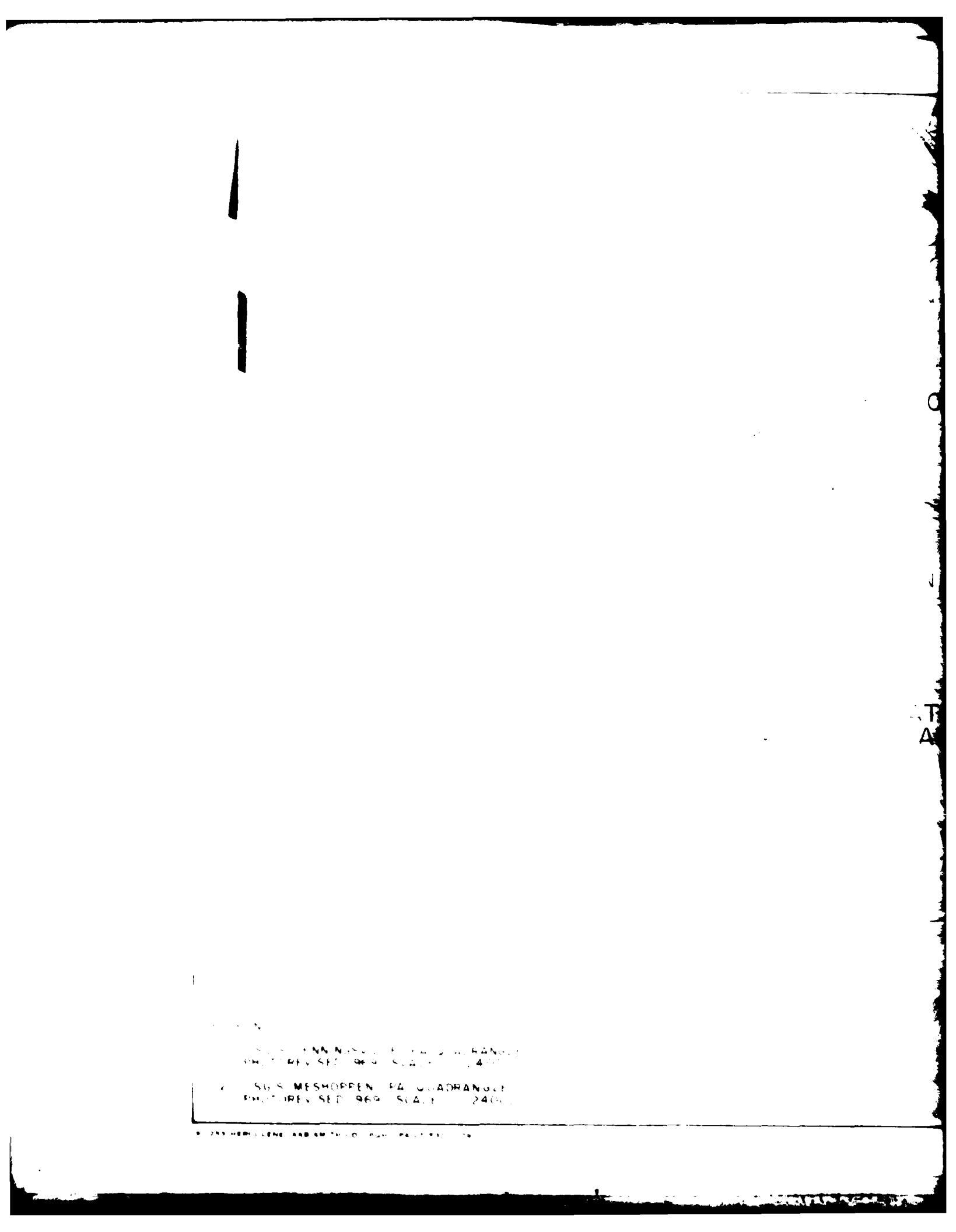
	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1055.00	1055.00	1058.70
STORAGE	357.	357.	561.
OUTFLOW	0.	0.	1559.

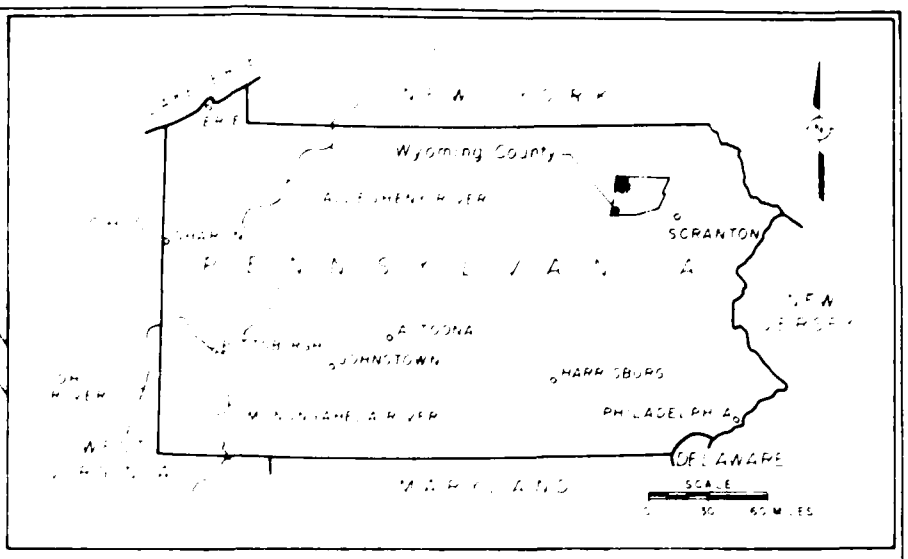
RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1058.17	0.00	529.	1077.	0.00	45.20	[illegible]
.30	1059.60	.90	618.	1978.	4.00	44.40	[illegible]
.40	1060.84	2.14	701.	3092.	5.80	43.60	[illegible]
.50	1061.87	3.17	773.	4231.	6.60	43.40	[illegible]
.60	1062.78	4.08	837.	5364.	7.40	43.00	[illegible]
.70	1063.58	4.88	896.	6498.	8.00	43.00	[illegible]
.80	1064.33	5.63	951.	7629.	8.40	42.80	[illegible]
.90	1065.00	6.30	1001.	8735.	8.80	42.60	[illegible]
1.00	1065.64	6.94	1050.	9855.	9.00	42.60	[illegible]

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1055.00	1055.00	1058.70
STORAGE	357.	357.	561.
OUTFLOW	0.	0.	1559.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	1058.17	0.00	529.	1077.	0.00	45.20	[illegible]
.30	1059.60	.90	618.	1978.	4.00	44.40	[illegible]
.40	1064.21	5.51	942.	7440.	5.00	42.80	[illegible]
.50	1064.80	6.10	986.	8397.	5.80	42.60	[illegible]
.60	1065.19	6.49	1016.	9173.	6.60	42.20	[illegible]
.70	1065.66	6.96	1051.	9896.	7.00	42.00	[illegible]
.80	1066.00	7.30	1077.	10518.	7.40	41.80	[illegible]
.90	1066.28	7.58	1099.	11045.	8.00	41.80	[illegible]
1.00	1066.51	7.81	1118.	11490.	8.40	41.80	[illegible]





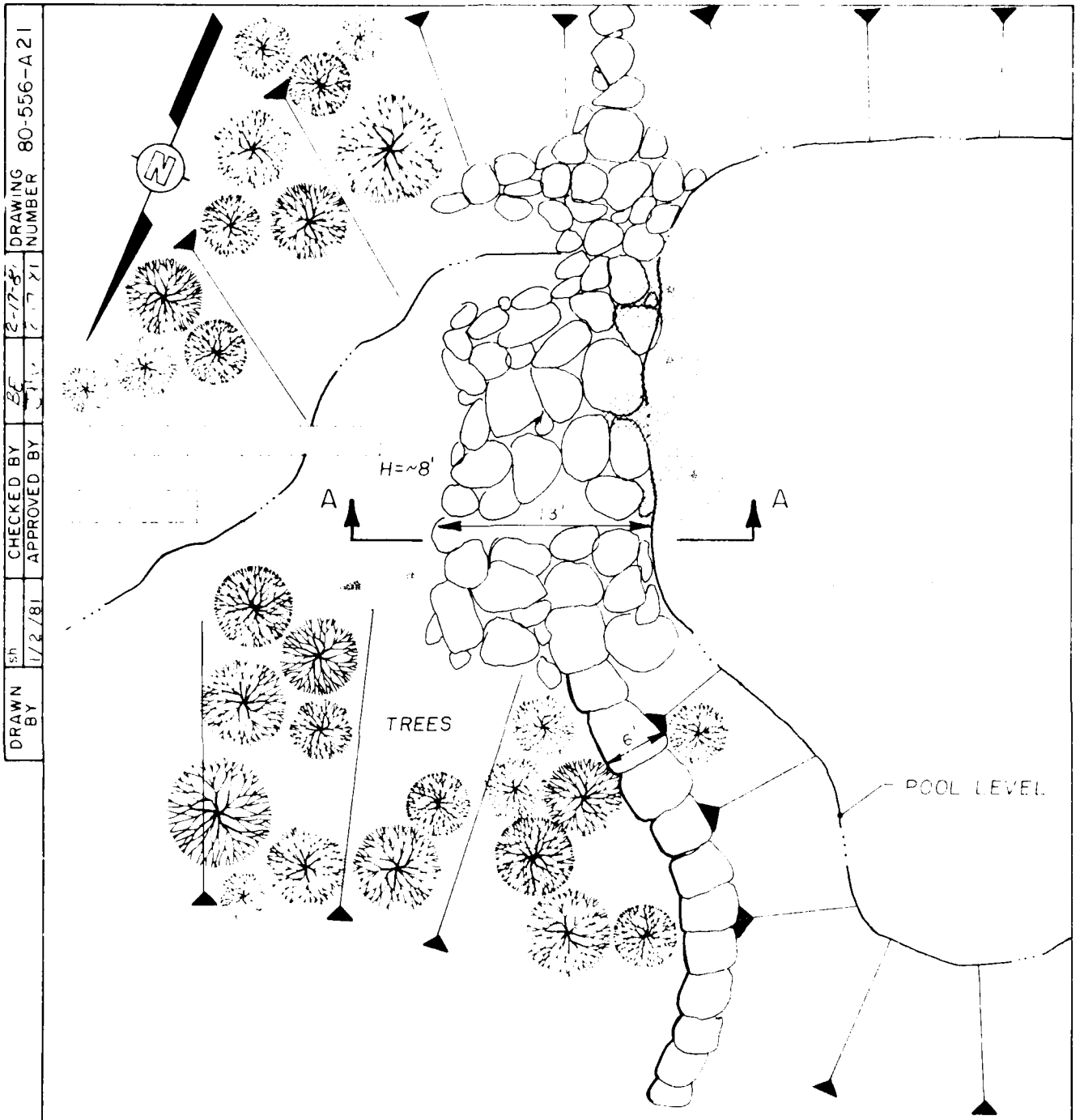
KEY PLAN

PLATE I

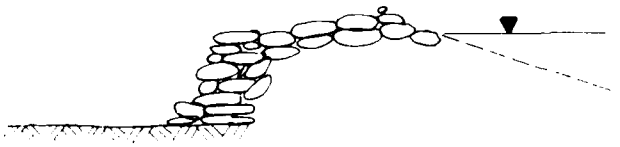
NEGRO POND DAM
VICINITY, FLOOD PLAIN & WATERSHED MAP

SCALE
0 2000 4000 6000 8000 10000 FEET

DAMPODIADNA



DRAWN BY	sh
	1/2/81
CHECKED BY	BE
APPROVED BY	
	2-17-81
DRAWING NUMBER	80-556-A21



SECTION A-A

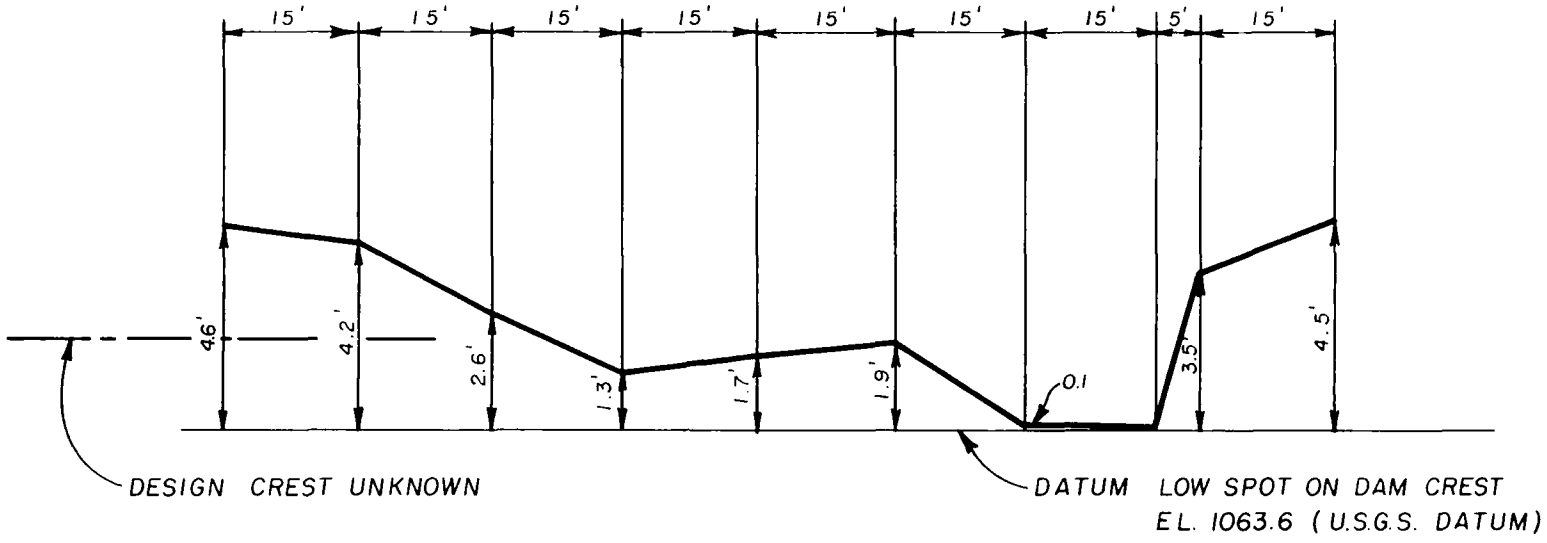
NOT TO SCALE

PLATE 2

NEGRO POND DAM
GENERAL PLAN
FIELD INSPECTION NOTES
FIELD INSPECTION DATE NOV 15, 1980

DRAPPROPRIATION

DRAWN BY	sh	CHECKED BY	BC	2-17-81	DRAWING NUMBER 80-556-A22
	12-22-80	APPROVED BY	JHO	2 17 81	



DAM CREST PROFILE
(LOOKING DOWNSTREAM)

NOTES:

1. DAM ELEVATION WAS INTERPOLATED FROM U.S.G.S. MAPS, THEREFORE IS APPROXIMATE.

PLATE 3

NEGRO POND DAM
DAM CREST SURVEY
FIELD INSPECTION DATE NOV. 12, 1980

DAPPLONIA

APPENDIX F

REGIONAL GEOLOGY

REGIONAL GEOLOGY
NEGRO POND, SHARPE'S POND,
CHAMBERLAIN POND AND JENNINGS POND DAMS

The Negro Pond, Sharpe's Pond, Chamberlain Pond, and Jennings Pond dams are located in the glaciated low plateaus section of the Appalachian Plateau physiographic province, characterized as a mature glaciated plateau of moderate relief.

The geologic structure consists of a series of northeast trending folds (approximately N70°E) which plunge gently to the southwest. The dip of the limbs of the folds in the vicinity of the dams is less than five degrees, with the southeast limb steeper than the northwest limb. The dams are located south of the Wilmot Anticline. In general, the discontinuity trends are northeast and northwest.

The stratigraphy consists of glacial till which will range in thickness from very thin to approximately 200 feet. The glacial till is underlain by the Devonian Chemung Formation, which is approximately 475 feet thick in this area. The Chemung Formation is marine in origin, consisting of green-gray sandstone, multicolored shale, and sandy shale. The shale strata tend to weather rapidly when exposed.

DRAWN BY	ACS	CHECKED BY		APPROVED BY		DRAWING NUMBER 80-556-A3
	1-2-81	BC	2-17-81	JMD	2-17-81	

SCALE

0 2 4 6 8 10 miles

GEOLOGY MAP

REFERENCE

GEOLOGIC MAP OF PENNSYLVANIA PREPARED BY COMMONWEALTH OF PENNA, DEPARTMENT OF ENVIRONMENTAL RESOURCES, DATED 1960
SCALE 1 250,000

D'APPOLONIA

DRAWN BY ACS 1-2-81 | CHECKED BY [illegible] 2-17-81 | APPROVED BY [illegible] 2-17-81 | DRAWING NUMBER 80-556-A4

PENNSYLVANIAN

APPALACHIAN PLATEAU

Pa — **Allegheny Group**
[illegible] includes Freeport, Kittanning and Clarion Formations

Pp — **Pottsville Group**
Predominantly sandstones and conglomerates with thin shales and coals; some coals [illegible] locally.

ANTHRACITE REGION

Pp — **Post-Pottsville Formations**
[illegible] sandstones with some conglomerate and numerous [illegible]able coals

Pp — **Pottsville Group**
Light gray to white, coarse [illegible] sandstones and conglomerates [illegible] includes Sharp Mountain, Schuylkill, and Tumbling Run Formations

MISSISSIPPIAN

Mmc — **Mauch Chunk Formation**
Red shales [illegible] Limestone in Fayette, Westmoreland and [illegible] at the base in [illegible] Pennsylvania

Mp — **Pocono Group**
[illegible] Appalachian Plateau [illegible]

DEVONIAN

UPPER

CENTRAL AND EASTERN PENNSYLVANIA

Do — **Oswayo Formation**
Brownish and greenish gray, fine and medium grained sandstones with some shales and scattered calcareous lenses; includes red shales which become more numerous eastward. Relation to type Oswayo not proved.

Dck — **Catskill Formation**
Chiefly red to brownish shales and sandstones; includes gray and greenish sandstone tongues named Elk Mountain, Honesdale, Shohola, and Delaware River in the east.

Dm — **Marine beds**
Gray to olive brown shales, graywackes, and sandstones; contains "Chemung" beds and "Portage" beds including Burket, Brallier, Harrell, and Trimmers Rock; Tully Limestone at base.

Ds — **Susquehanna Group**
[illegible] "Chemung" [illegible] Second Pennsylvania Survey County reports [illegible] "Chemung" [illegible]

GEOLOGY MAP LEGEND

REFERENCE.

GEOLOGIC MAP OF PENNSYLVANIA PREPARED BY COMMONWEALTH OF PENNA., DEPARTMENT OF ENVIRONMENTAL RESOURCES, DATED 1960
SCALE 1 : 250,000

D'APPOLONIA